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PATENT

RESPONSE UNDER 37 C.F.R. § 1.116
EXPEDITED PROCEDURE – EXAMINING GROUP 1600

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June 14, 2004
Date

Dan Parker
Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Application No. : 09/876,830 Confirmation No. : 8679

Filed : June 6, 2001

Title : FLUORESCENT QUENCHING DETECTION REAGENTS
AND METHODS

Examiner : Jezia Riley
Art Unit : 1637
Docket No. : 290097.405

Supplemental Response Under 37 CFR § 1.116

-Commissioner for Patents:

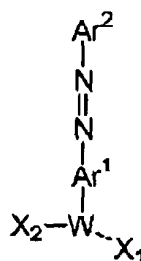
In further response to the Office Action dated January 16, 2004, in the above-identified application, where Applicants previously responded to the Office Action on February 17, 2004, please amend the application as indicated below, and please consider the following remarks:

Remarks begin on page 10 of this paper.

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1-26. (Canceled)

27. (Currently Amended) A compound having the formula:



wherein

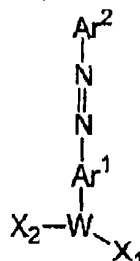
Ar^1 and Ar^2 are each independently a substituted or unsubstituted aryl group, where at least one of Ar^1 and Ar^2 is a substituted aryl;

X_1 is selected from the group consisting of OH, O-dimethoxytrityl, O-methoxytrityl, O-trityl and an oxygen atom having an acid labile blocking group;

X_2 is a phosphoramidite; and

W is a linking group having from 3 to 100 backbone atoms selected from C, N, O, S, Si and P, said linking group being cyclic, acyclic, aromatic or a combination thereof.

28. (Currently Amended) A compound having the formula:



wherein

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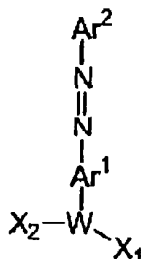
Ar^1 and Ar^2 are each independently a substituted or unsubstituted aryl group, where at least one of Ar^1 and Ar^2 is a substituted aryl;

X_1 is selected from the group consisting of H, (C_1-C_{12}) alkyl, aryl, heteroaryl, and protected or unprotected functional group;

X_2 is selected from the group consisting of a phosphorous coupling moiety, a pentafluorophenoxy moiety and a succinimidyli moiety; and

W is a linking group having from 3 to 100 backbone atoms selected from C, N, O, S, Si and P, said linking group being cyclic, acyclic, aromatic or a combination thereof.

29. (Currently Amended) A compound having the formula:



wherein

Ar^1 and Ar^2 are each independently a substituted or unsubstituted aryl group, where at least one of Ar^1 and Ar^2 is a substituted aryl;

X_1 is selected from the group consisting of H, (C_1-C_{12}) alkyl, aryl, heteroaryl, and protected or unprotected functional group;

X_2 is a phosphoramidite; and

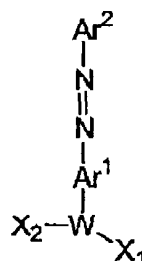
W is a linking group having from 3 to 100 backbone atoms selected from C, N, O, S, Si and P, said linking group being cyclic, acyclic, aromatic or a combination thereof.

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30. (Canceled)

31. (Canceled)

32. (Previously Amended) A compound having the formula:



wherein

Ar^1 and Ar^2 are each independently a substituted or unsubstituted aryl group;

X_1 is selected from the group consisting of H, $(\text{C}_1\text{-C}_{12})$ alkyl, aryl, heteroaryl, and protected or unprotected functional group;

X_2 is a moiety reactive towards nucleophiles;

W is a linking group having from 3 to 100 backbone atoms selected from C, N, O, S, Si and P, said linking group being cyclic, acyclic, aromatic or a combination thereof; and

wherein one of Ar^1 and Ar^2 is directly or indirectly substituted with a substituted aryl group (Ar^3), where Ar^3 extends the resonance ability of the $\text{Ar}^1\text{-N=N-Ar}^2$ aromatic system and thereby increases the wavelength absorbance maximum of the compound.

33. (Previously Added) A compound of claim 32 wherein Ar^1 is directly substituted with Ar^3 .

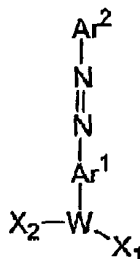
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34. (Previously Added) A compound of claim 32 wherein Ar¹ is indirectly substituted with Ar³.

35. (Previously Added) A compound of claim 32 wherein Ar² is directly substituted with Ar³.

36. (Previously Added) A compound of claim 32 wherein Ar² is indirectly substituted with Ar³.

37. (Previously Amended) A compound having the formula:



wherein

Ar¹ and Ar² are each independently a substituted or unsubstituted aryl group;

X₁ is selected from the group consisting of H, (C₁-C₁₂)alkyl, aryl, heteroaryl, and protected or unprotected functional group;

X₂ is a phosphoramidite;

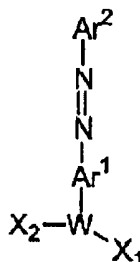
W is a linking group having from 3 to 100 backbone atoms selected from C, N, O, S, Si and P, said linking group being cyclic, acyclic, aromatic or a combination thereof; and

wherein Ar¹ or Ar² is indirectly substituted with an aryl group (Ar³) through a group selected from $-(\text{C}\equiv\text{C})_n-$ and $-(\text{CR}'=\text{CR}')_n-$ where n is 0 to 5 and R' is

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independently selected from hydrogen, (C₁-C₈)alkyl and heteroalkyl, unsubstituted aryl and heteroaryl, (unsubstituted aryl)-(C₁-C₄)alkyl, and (unsubstituted aryl)oxy-(C₁-C₄)alkyl.

38. (Previously Amended) A compound having the formula:



wherein

Ar¹ and Ar² are each independently a substituted or unsubstituted aryl group;

X₁ is selected from the group consisting of H, (C₁-C₁₂)alkyl, aryl, heteroaryl, and protected or unprotected functional group;

X₂ is a phosphoramidite;

W is a linking group having from 3 to 100 backbone atoms selected from C, N, O, S, Si and P, said linking group being cyclic, acyclic, aromatic or a combination thereof; and

Ar¹ or Ar² is indirectly substituted with an aryl group (Ar³) through a double bond selected from carbon-carbon and nitrogen-nitrogen double bonds.

39. (Canceled)

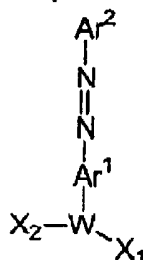
40. (Canceled)

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41. (Previously Amended) A compound having the formula:



wherein

Ar^1 and Ar^2 are each independently a substituted or unsubstituted aryl group;

X_1 is selected from the group consisting of H, $(\text{C}_1\text{-C}_{12})$ alkyl, aryl, heteroaryl, and protected or unprotected functional group;

X_2 is a phosphoramidite;

W is a linking group having from 3 to 100 backbone atoms selected from C, N, O, S, Si and P, said linking group being cyclic, acyclic, aromatic or a combination thereof;

wherein one of Ar^1 and Ar^2 is directly or indirectly substituted with a substituted aryl group (Ar^3), where Ar^3 extends the resonance ability of the $\text{Ar}^1\text{-N=N-Ar}^2$ aromatic system and thereby increases the wavelength absorbance maximum of the compound; and

at least one of Ar^1 , Ar^2 and Ar^3 is substituted with -halogen, -OR', -OC(O)R', -NR'R'', -SR', -R', -CN, -NO₂, -CO₂R', -CONR'R'', -C(O)R', -OC(O)NR'R'', -NR''C(O)R', -NR''C(O)₂R', -NR'-C(O)NR''R''', -NH-C(NH₂)=NH, -NR'C(NH₂)=NH, -NH-C(NH₂)=NR', -S(O)R', -S(O)₂R', -S(O)₂NR'R'', -N₃, -CH(Ph)₂, perfluoro(C₁-C₄)alkoxy, and perfluoro(C₁-C₄)alkyl, in a number ranging from zero to the total number of open valences on the aromatic ring system; and where R', R'' and R''' are independently selected from hydrogen, $(\text{C}_1\text{-C}_8)$ alkyl and heteroalkyl, unsubstituted aryl and heteroaryl, (unsubstituted aryl)-(C₁-C₄)alkyl, and (unsubstituted aryl)oxy-(C₁-C₄)alkyl.

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42. (Previously Added) A compound of claim 27 wherein W is acyclic.
43. (Previously Added) A compound of claim 27 wherein W comprises a cyclic group.
44. (Previously Added) A compound of claim 28 wherein W is acyclic.
45. (Previously Added) A compound of claim 28 wherein W comprises a cyclic group.
46. (Previously Added) A compound of claim 29 wherein W is acyclic.
47. (Previously Added) A compound of claim 29 wherein W comprises a cyclic group.
48. (Previously Added) A compound of claim 32 wherein W is acyclic.
49. (Previously Added) A compound of claim 32 wherein W comprises a cyclic group.
50. (Previously Added) A compound of claim 33 wherein W is acyclic.
51. (Previously Added) A compound of claim 33 wherein W comprises a cyclic group.
52. (Previously Added) A compound of claim 34 wherein W is acyclic.
53. (Previously Added) A compound of claim 34 wherein W comprises a cyclic group.

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54. (Previously Added) A compound of claim 35 wherein W is acyclic.
55. (Previously Added) A compound of claim 35 wherein W comprises a cyclic group.
56. (Previously Added) A compound of claim 36 wherein W is acyclic.
57. (Previously Added) A compound of claim 36 wherein W comprises a cyclic group.
58. (Previously Added) A compound of claim 37 wherein W is acyclic.
59. (Previously Added) A compound of claim 37 wherein W comprises a cyclic group.
60. (Previously Added) A compound of claim 38 wherein W is acyclic.
61. (Previously Added) A compound of claim 38 wherein W comprises a cyclic group.
62. (Previously Added) A compound of claim 41 wherein W is acyclic.
63. (Previously Added) A compound of claim 41 wherein W comprises a cyclic group.
64. (Previously Added) A compound of claims 28, 32-36 or 48-57 wherein X₂ is a phosphoramidite.